



**City of Bowling Green
Administrative Instruction No. 48**

Powered Industrial Truck Training Program

The following rules outline safe operations for powered industrial trucks. The term forklift will refer to both the narrow aisle and ride-on unless otherwise stated. Operators will refer to employees who operate a forklift in this facility. Operators must be thoroughly familiar with the provisions of this program and must comply with them during everyday operation. Only selected employees, certified by an authorized examiner, will be allowed to start or operate any forklift or powered industrial truck at a City facility.

After successfully passing a written test pertaining to the safe operating procedures and a practical operation test to demonstrate ability to safely operate both types of forklifts, the employee will be certified and permitted to operate a forklift.

The City of Bowling Green reserves the right to conduct a full training program any time a department or division head believes it is necessary in order to continue the City's Powered Industrial Program in a safe and efficient manner.

The City of Bowling Green is committed to providing a safe and healthy work environment for its employees. This commitment requires that all employees perform their duties in a safe manner at all times. In order to fulfill this commitment the City will comply with all laws that regulate safety in the workplace and will also implement the safest design and construction of all operations. A safe and healthy working environment is directly tied to efficient production. In order for the City's safety program to be successful, each employee must act to identify and eliminate unsafe working conditions and procedures.

CFR 1910.178(l) states the following:

(l) Operator Training. Only trained and authorized operators shall be permitted to operate a powered industrial truck. Methods shall be devised to train operators in the safe operation of powered industrial trucks.

While the State of Ohio's safety program, which utilizes the OSHA regulations, requires that training methods be devised, it does not specify the amount, type or frequency of training necessary. These decisions are to be based on such factors as the equipment, operations and employees involved. Training should include, at a minimum, the following:

- 1 Inspecting the truck prior to use.
- 2 Procedures when truck defects are found.
- 3 Function and proper use of truck controls.
- 4 General truck loading practices including loading/unloading highway trucks, trailers and rail cars.
- 5 Truck operation such as traveling speeds, cornering speeds, driving near pedestrians, the importance of adequate clearance and of looking in the direction of travel.
- 6 Determining whether the load is safe to handle.
- 7 Correct piling/stacking of materials in stock.
- 8 Precautions when leaving a truck unattended.
- 9 Working in hazardous environments or with hazardous materials.
- 10 Refueling or recharging operations.
- 11 Specific hazards of the truck operators' prospective tasks.

All employees who operate a forklift, Narrow Isle or ride-on, need training first, even if they only operate a forklift occasionally. New hires with previous or extensive training need at least a test of operation proficiency and instructions in the hazards of their jobs.

Basic Forklift Driving Rules

1. Each operator will be held responsible for protecting the safety of pedestrians and workers in his/her area. The operator is the sole person in charge of the forklift and will be held accountable for any injury or property damage, which is the result of poor judgment or neglect of safe operating practices.
2. Forklifts shall not be driven up to anyone standing in front of any fixed object, nor will an operator allow anyone to stand or pass under the elevated portion of any truck whether loaded or empty. Unauthorized persons are not permitted to ride on forklifts. The operator will take caution not to place arms or legs between the uprights of the mast or outside the running lines of the trucks.
3. Forklifts shall be checked for fuel, water, oil and safety equipment before starting operation. All needed repairs must be reported to a Supervisor and recorded on the "Daily Inspection Check Sheet". Forklifts shall not be operated if any detected condition is felt to be unsafe for operation.
4. Operators shall follow general traffic rules, keeping to the right, stopping at blind corners and intersections, and using horn and hand signals. Other forklifts traveling in the same direction shall not be passed. Five (5) MPH is the established speed limit for this facility.
5. Under all travel conditions the forklift shall be operated at a speed that will permit it to be brought to a stop in a safe manner. Operators shall be required to slow down for wet and slippery surfaces to retain maximum control over their forklift at all times. Running over loose objects on road surface shall be avoided. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.
6. Forklifts must travel with forks approximately 2" above floor or ground level and at no time in excess of 4 inches. When traveling with a load, the load should be kept as low to ground level as possible to maintain a stable center of gravity.
7. Forklifts must be parked in designated areas away from aisles, traffic lanes, and emergency exits. Forklifts shall not be parked on inclines or slopes without the wheels being blocked. Whenever the operator dismounts the forklift, all load engaging means shall be fully lowered, controls neutralized, and the brakes set to prevent movement. If the operator is 25 ft. or more away and the forklift is not within view, the power shall be shut off.
8. In cases where it is necessary for the operator to raise a person to a height of more than three (3) feet from the ground level, an approved platform and cage must be used and securely attached to the lift mast and not to the forks alone. Persons being lifted must assure a safe position while being raised and lowered. Under no condition should a person be transported from one place to another while on the platform.
9. Gasoline, battery and LP forklifts are to be serviced only in designated safe areas. Engine must be shut off before servicing. If spillage occurs, restart must be delayed until fuel evaporates or fumes disappear.

Operating The Forklift

Driving Forward and Backward

1. Depress the speed control pedal for the speed desired. (Maximum acceleration is regulated by a time delay feature incorporated in the electrical circuit).
2. To change direction of travel, the operator should take his/her foot off the speed control pedal for a second or two, move the directional control lever to the opposite direction, then depress pedal again. Operators can speed the slowdown by applying the foot brakes.
3. To stop the machine, remove foot from speed control pedal and depress brake pedal sufficiently to allow a safe, smooth stop.
4. If the machine is to be parked, lower forks to floor, turn key switch to "off" and place directional lever in "neutral." When the driver's seat is unoccupied, the "dead-man brake" is automatically applied.

Steering and Turning

1. Forklifts steer with the rear wheel. The rear end swings wide when making a turn while the forklift pivots on the front wheels. This action permits the forklift to make sharper turns in smaller spaces such as narrow aisles and storage areas. Remember that the drive wheel on the inside of the steering arc is the guide.
2. A conscientious operator will always make turns gradually. Fast, sharp turns may spill a load or cause a collision with a pedestrian or another forklift.

Picking Up The Load

1. Approach the load straight-on with the forks parallel to the floor. Adjust the forks sidewise so that the spread of the forks matches the width of the load or pallet.
2. Approach the load slowly. Raise or lower forks to a proper level and drive forward until load touches carriage. Center load as closely as possible. Tilt mast back slightly and lift slowly, accelerating a little bit at the same time. The operator must never take his/her eyes off the load. When the load has been lifted clear, back away from stack.
3. Always make sure load is against carriage and load backrest. The reason for this is that the weight of the forklift has to balance the weight of load. The farther out the center of the load is, the less weight the forklift can lift safely.

Driving with the Load

1. Avoid fast starts and stops. This can result in tossing or spilling the load or causing a collision between the forklift and the one following. Besides, fast starts are hard on tires, clutch, and drive train. Sudden stops also cause rapid wear of tires and brakes.
2. Loaded or empty, raise forks just high enough to clear obstruction. Driving with load raised high is extremely dangerous. A sudden stop or sharp turn may cause the load to topple and could possibly injure pedestrians.
3. Avoid running over obstruction, large or small. They can damage tires and other components, a spilled load or even overturn the forklift.
4. The operator must always look in the direction he/she is traveling. Even if the operator has just driven through an area and knows it is clear, he/she should always look where he/she is going. If the load is so bulky that the operator cannot see over it or around it, drive backwards. Never drive with visibility obstructed.
5. Keep an eye on overhead obstructions. Watch fire lines, sprinkler heads, light fixtures, and door frames. Be very careful when lifting and transporting a load.
6. Take special care when operating on ramps and other inclines. Make sure the load is well stacked and stable so that maneuvering on the incline does not cause it to spill. Drive forward going up an incline. Drive backward when going down an incline. This keeps the load rested firmly against carriage or backrest of the truck.

Unload

1. When depositing the load, enter the area squarely. Set loads down slowly in the desired position. Never butt or ram a load with forks. If a load is placed incorrectly, pick it back up and maneuver it correctly into position.

Stacking

1. Approach to within a foot or so of stack or tier with the load held low. Stop, raise load slowly while inching forward. When load reaches the desired height, tilt upright forward until it is vertical. Position load over the stack so it lines up squarely.
2. Lower the load slowly. When it is resting solidly on the stack and forks are free, back forklift away.
3. Extreme care must be taken when mast and load are raised high. The heavier the load is and the higher the operator raises it, the higher forklift's center of gravity is forced, thus reducing stability. When lifting a load, always check to see if there are any overhead obstructions that might damage or cause the load to spill.
4. Never allow other employees to stand nearby when materials are stacked. If something should fall from the load, it could severely injure a bystander.

Safety Tips

1. **Check the Truck.** A Forklift should be checked daily before being placed into service. If found to be in need of repair, defective or in any way unsafe, it should be reported immediately to the proper authority and the forklift removed from service until it has been restored to safe operating condition.
2. **Keep Inside.** Only operate a forklift from the designated operating position. Never place any part body parts into the mast structure, between the mast and the truck, or outside the truck. Do not carry passengers.
3. **Protect Yourself.** Do not operate a forklift without an overhead guard or load backrest extension, unless conditions prevent their use. Use special care if operating without these guards is required.
4. **High Loads.** Do not handle loads, which are higher than the load backrest or load backrest extension unless the load is secured so that no part of it could fall backward.
5. **Stabilize the Load.** Do not handle unstable or loosely stacked loads. Use special care when handling long, high or wide loads, to avoid losing the load, striking bystanders, or tipping the forklift.
6. **Center the Load.** When maneuvering the forks, space them as far apart as the load will permit. Before lifting, make sure the load is centered and forks are completely under the load.
7. **Never Overload.** Do not overload the forklift. Check capacity plate for load weight and load center information.
8. **Avoid Sudden Movement.** Start, stop, travel, steer, and brake smoothly. Use special care when traveling without a load as the risk to overturn the forklift is greater.
9. **Look Overhead.** Elevate forks or other lifting mechanism only to pick up or stack a load. Lift and lower with the mast vertical or tilted slightly back NEVER FORWARD. Watch out for obstructions especially overhead.
10. **Minimum Tilt.** Operate tilting mechanism slowly and smoothly. Do not tilt it forward when elevated except to pick up or deposit a load. When stacking, use only enough backward tilt to stabilize the load.
11. **Eyes Ahead.** Travel with the load or lifting mechanism as low as possible and tilted back. Always look in the direction of travel. Keep a clear view, and when a load interferes with visibility, travel with the lifting mechanism trailing (except when climbing ramps).
12. **Care on Ramps.** Use special care when operating on ramps-travel slowly, and do not angle or turn. When truck is loaded, travel with the load uphill. When the truck is empty, travel with the lifting mechanism downhill.
13. **Slow Down.** Observe applicable traffic regulations. Yield right-of-way to pedestrians. Slow down and sound horn at cross aisles and wherever vision is obstructed.
14. **Watch People.** Do not allow anyone to stand or pass under load or lifting mechanism.
15. **Use Work Platform.** Do not lift personnel except on securely attached, specially designed work platforms. Use extreme care when lifting personnel. Place mast in vertical position, place truck control in

neutral and apply brakes. Lift and lower smoothly. Be available to operate controls as long as personnel are on the work platform. Never transport personnel on forks or work platform.

16. **Shut Down Completely.** Before getting off the lift truck, neutralize travel control; fully lower lifting mechanism and set parking brake. When leaving truck unattended, also shut off the power. Block wheels if truck is parked on an incline.

Training Guide

1. Modern lift trucks come in many types and capacities, but they all have one thing in common – they could cause damage or physical injury if improperly used or maintained.
2. This makes operating a lift truck a responsibility requiring not only basic operating knowledge but good common sense.
3. This program is designed to help operators understand how electric lift trucks operate and the basic safety precautions to consider regardless of the type of electric truck operated.
4. Additional information on safety standards for lift trucks can be found in the *American National Standard* regulation number B56.1.
5. Understand how a powered industrial truck operates is key to protecting the operator, the equipment, and other people working in the area.
6. The City has made a sizeable investment to provide safe powered industrial trucks to handle materials within its facilities. But the best equipment is only as good as the person operating it.
7. The many types of electric powered lift trucks can be broken down into four major groups. There are high-lift riders, low-lift riders, stock pickers, and walkies.
 - A. High-lift riders allow the operator to lift high enough to stack and tier materials.
 - B. Low-lift trucks are for moving materials from place to place.
 - C. This is a stock picker, sometimes called an order picker. It allows the operator to pick and carry materials at high elevations.
 - D. The fourth type of truck is the walkie or motorized hand truck, where the operators do not ride, but walk along with their trucks. These fall in two major groups – stackers and pallet trucks.
8. But no matter what kind of truck operated, there are some basic rules an operator needs to know that apply to easy, safe, and efficient handling of materials. It's valuable information even for experienced operators.
9. When operating a lift truck, the operator has to learn some basic laws of physics. For instance: there are two basic types of lift trucks – counterbalance and straddle.
 - A. In the counterbalance type, the weight at the rear of the truck balances the weight of the load, much like a balance scale or child balancing on a teeter-totter.
 - B. In the straddle type, the weight of the load is supported by outriggers, which straddle the pallet. It's similar to straddling a heavy object and manually lifting it. Person would use his/her legs and back for support. Straddle trucks can be shorter in length because no counterbalance weight is needed.

10. There are two of basic principles. Knowing the different upright and fork heights of a truck can be a simple key to safety.
11. The collapsed height of a truck is the distance from the highest point of the truck to the floor when the forks are fully lowered. In this position hitting most overhead obstructions can be avoided.
12. Care must be taken in this position. This is the maximum fork height; the highest the truck can lift a load. Fork height is measured from the floor to the top of the forks.
13. The overall extended height is measured from the floor to the highest point of the truck when the uprights are in the fully extended position. Know the overall extended height and watch out for water pipes, doorways, and low ceilings.
14. Free lift. Free lift is the height an operator is able to lift the forks before the collapsed height of the truck starts to increase. The lift is free at this point because the height of the truck hasn't yet increased. Free lift height is important to know when the operator is stacking in a low ceiling area or inside a highway truck.
15. When the operator is ready to start driving, there are some important visual safety checks to make.
 - A. Check the battery, the charge, the water level, and make sure the vent caps are in place.
 - B. Disconnect and re-engage the battery connector. Then make sure it's secure.
 - C. Take a good look at the tires and load wheels. Are they in good condition?
 - D. Now take a quick walk around the truck and check to see that everything is secure and in place. Pay particular attention to any safety guards on the truck.
 - E. Sound the horn and try out the forks: raise and lower. Travel slowly and apply the brakes. Check the steering.
 - F. Run through the speeds; forward and reverse. If the truck has other hydraulic functions; such as reach or tilt, test their function.
16. If any malfunction is discovered, do not operate the truck. Take it out of service, so that it can be repaired.
17. When picking up a load, remember that load stability is the most important factor. A good rule of thumb is to place the forks at least three-quarters of the distance under the load.
18. Forks too long for a load can damage other materials behind the load the operator is working with.
19. If the forks are too short, the operator will be operating under unstable load conditions. The load could tilt off the end of the forks. Make sure that the forks are spread wide and are evenly centered under the load.
20. To help avoid most problems in load situations, it is important to know the load center and capacity ratings of the truck. The ratings are listed on the identification tag on the truck.
21. The capacity rating of the truck indicates the heaviest weight it can lift at the given load center to its maximum fork height.
22. The load center rating is a measurement that is one-half the length of a load when the weight of that load is evenly distributed.

23. For example: If a truck is rated at a 3000-pound capacity at a 24-inch load center. This means an operator can safely lift to the specified height and transport lowered an evenly distributed load 48 inches long weighing 3000 pounds.
24. However, an operator should never exceed the load capacity of the truck. But an operator may be able to exceed the load center rating; provided the weight of the load is decreased.
25. Use extra care when handling any loads longer than normal. Allow extra room when turning since long loads will swing wider. If an operator regularly handles loads longer than the load center rating shown on the truck's ID tag, they are to ask their supervisors to obtain a tag showing the capacity at the longer load center.
26. Note: High lift trucks are capable of lifting full capacity loads to only part of their maximum lift height. Check the truck's ID tag to learn what capacities are available at the higher heights.
27. Operators should know the capacity ratings at a given load center before an attempt is made to lift a load. This will aid in preventing accidents. An operator may discover what's called the pivot point of his/her truck the hard way if they don't know the capacity ratings for the truck.
28. When operating a counterbalance truck, the front wheels are the pivot point between the weight of the truck and the weight of the load.
29. The pivot point of a straddle truck is at the load wheels at the end of the straddles.
30. If an operator does not know the capacity and load center ratings of his/her truck, the operator could end up flat on the truck's pivot point! Know the truck's capacity!
31. A load that is not evenly distributed can mean a deceiving load center length to the center of gravity of the load.
32. Keep the heavier part of the load toward the truck.
33. If the truck's uprights can be tilted, tilt the load back to help stabilize it.
34. Extreme care should be used when tilting forward, particularly when high stacking. Tilting forward increases the load center.
35. One of the most important concepts for the driver to understand is the stability triangle of the truck. The majority of lift trucks; even four-wheel articulated trucks, have three point suspension. The stability triangle is an imaginary line connecting the three suspension points underneath the truck. The center of gravity of a truck without a load is a point within the stability triangle.
36. When a load is placed on the forks, the center of gravity moves forward because of the added weight in the front end.
37. Tilting the uprights back will cause the center of gravity to move back.
38. A load that's too heavy or tilting the uprights too far forward could cause the center of gravity to move outside the stability triangle.
39. When the center of gravity moves outside the stability triangle, the truck is being operated unsafely.
40. Thinking about the stability triangle becomes particularly important when cornering, with or without a load. Always pay attention to the speed of the truck!

41. Cornering a truck moves the center of gravity to its side.
42. Taking a corner too fast or with a side-heavy load can cause the center of gravity to move outside of the stability triangle.
43. Anytime the center of gravity moves to the outside, the truck could turn over. Use special care when traveling without a load. This is when the risk of overturn is greater because there is less gross weight.
44. A operator may not be able to see the stability triangle or the movement of the center of gravity, but he/she can get a good feel for his/her truck and let common sense prevail.
45. Be aware of any warning labels on the truck. If operators don't understand their meaning(s), they must ask their supervisors.
46. Know the truck's capacity and load center. Do not try to move a load that is too heavy for the truck. Inform the supervisor of the problem rather than attempting to move the load.
47. If a load looks unstable, or if it's poorly stacked on a pallet, don't move it. If necessary, get someone to help re-stack it.
48. Always use special care when handling a load that is extra long, wide, or high to prevent tipping the load or truck.
49. After picking up a load that can be safely transported, travel in a direction that offers the best visibility.
50. When lifting, watch out for overhead obstructions and low ceilings. When traveling, look out for doorways, water pipes, or anything that can hang from a ceiling.
51. Use extra caution when changing directions, and always come to a complete stop. A quick shift from forward to reverse and the load may just keep right on going.
52. When coming to a ramp or dock board, stop. Make sure that the truck and load can safely negotiate any incline. Never park on ramps or inclines.
53. Always keep the load toward the top of the upgrade with the truck forks in a lowered position. When traveling unloaded, keep the fork end downgrade.
54. Operate a loaded truck just the opposite on an incline. Move up or down the incline slowly with the load always on the downgrade and away from the operator.
55. Avoid turning on ramps. Travel straight up and down.
56. Observe all traffic regulations and facility speed limits, and slow down or stop and sound the horn when vision is obstructed.
57. When following another lift truck, stay at least three truck lengths behind.
58. Do not drive over objects lying on the floor.
59. Keep the truck's forks low, and where possible, tilted back when traveling.
60. Slow down on wet or slippery floors.
61. Never allow anyone to pass or stand under an elevated load or forks.

62. Do not drive with wet or greasy hands.
63. Never use a truck in an unauthorized area.
64. Always slow down in a turn and keep the forks low. Remember in a turn the stability triangle and center of gravity is very important.
65. Be extra careful when entering highway trucks, trailers, or railway cars. They should have their wheels chocked or stops engaged to prevent movement.
66. Before driving over a dock board or bridge plate, check to see if it is secured properly. Never exceed their rated capacity.
67. As a driver of a rider truck, always keep arms, hands, legs, and feet inside the truck.
68. Never give someone a lift or try to use someone as a counterweight. There is no safe place to ride.
69. Most walkies were not designed to be ridden on.
70. Never put any part of the body into the mast assembly or in between the mast and truck frame.
71. This also holds true on reach mechanisms or other attachments. Stay clear!
72. Beware of situations where someone is standing in front of a fixed object. An operator may accidentally travel in the wrong direction and there is no escape route for someone working at a bench or machine.
73. Look out for others. It is the operator's responsibility to keep other people clear of the forklift. Pedestrians always have the right-of-way.
74. While speed is important, be careful when stacking or picking off a stack. Watch the load at all times.
75. When finished with the truck or when leaving it unattended, always park it in a designated or out-of-the-way place. Do not block fire aisles, stairways, or fire extinguishers.
76. Make sure the truck's forks are fully lowered. Partially raised forks can result in a tripping block.
77. Remove the key, or disconnect the connector plug so that unauthorized personnel cannot use the truck.
78. Many electric truck operators are responsible for the condition and recharging of the battery. Here are a few suggestions that will help an operator give the battery proper care.
79. Charge the battery in designated areas only. Make sure that the charger being used matches the voltage and amperage of the truck battery.
80. The battery voltage is listed on the truck's identification tag.
81. Before disconnecting or connecting batteries to a charger, make sure the charger is off . An attempt to disconnect or connect the battery while the charger is on could result in serious injury to the battery, the charger, or the operator.
82. Before charging, make sure the battery cells contain the correct amount of water. Don't overfill. Charging batteries with a low water level might result in damage to the cells.

83. Never use a match or lighter to check water levels. Battery fumes are explosive. Never smoke in the charging area.
84. Before connecting the battery cable to the truck's receptacle, make sure the key switch is in the off position and that the brakes are locked.
85. The battery connector must be fully connected before the truck is used.
86. If the connector is not making good contact, heat will weld the two parts of the battery connector together making it difficult to remove and necessary to replace.
87. The battery should be regularly checked for corrosion and cleaned. Good battery care is essential, not only for operation, but also for proper charging of the battery.
88. Should the battery ever need to be removed or replaced, be certain any spacers or restraining devices are properly reinstalled.
89. Do not operate a truck where battery movement exceeds ½ inch in any horizontal direction. Shifting batteries greatly affect the truck's center of gravity.
90. Always refer to the charger manufacturer's instructions for their specific charging procedures.

Definitions.

Center of gravity - The point on an object at which all of the object's weight is concentrated. For symmetrical loads, the center of gravity is at the middle of the load.

Counterweight - The weight that is built into the truck's basic structure and is used to offset the load's weight and to maximize the vehicle's resistance.

Fulcrum - The truck's axis of rotation when it tips over.

Grade - The slope of a surface, which is usually measured as the number of feet of rise or fall over a hundred foot horizontal distance.

Lateral stability - The truck's resistance to overturning sideways

Line of action - The imaginary vertical line through an object's center of gravity.

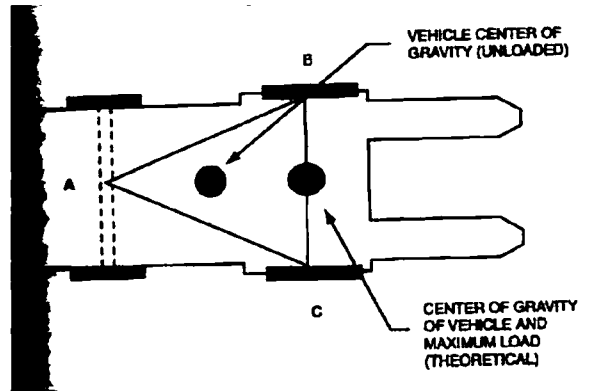
Load center - The horizontal distance from the load's edge (or the fork's or other attachment's vertical face) to the line of action through the load's center of gravity

Longitudinal stability - The truck's resistance to overturning forward or rearward

Track - The distance between the wheels on the same axle of the truck.

Wheelbase - The distance between the centerline of the vehicle's front and rear wheels.

Stability Triangle – The truck's steer axle is attached to the truck by a pivot pin in the axle's center. Then the points are connected with imaginary lines, this three point support forms a triangle.



Note: When the vehicle is loaded, the combined center of gravity (CG) shifts toward line B-C. Theoretically the maximum load will result in the CG at the line B-C. In actual practice, the CG should never be at line B-C.

The addition of additional counterweight will cause the truck CG to shift toward point A and result in a truck that is less stable laterally.


John B. Quinn, Mayor

3-29-04
Date

Powered Industrial Truck Training Program

This handout has been issued to the employee listed below in preparation for the written exam and the driving assessment

Name: _____

Date: _____

Signature and Date of Receipt

The Powered Industrial Truck Program and the issuance of a Forklift Operator's License is the authorization in which employees are permitted to operate a forklift and does not in any way recommend or authorize any employee to operate a powered industrial truck outside of the City of Bowling Green or its facilities. The Powered Industrial Truck Program was specifically designed for operations within the City of Bowling Green. The City of Bowling Green is not to be considered a licensing agency for the operation of Powered Industrial Trucks at any other employer's facility.